

FORM PTO-1390U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE
(REV 5-93)TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER

9021-11

U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5)

09/937067

INTERNATIONAL APPLICATION NO.

PCT/GB00/00966

INTERNATIONAL FILING DATE

March 21, 2000

PRIORITY DATE CLAIMED

March 23, 1999

TITLE OF INVENTION

BATTERY CASING

APPLICANT(S) FOR DO/EO/US

Eliot Crowe and James Roger Knight

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(I).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau). Courtesy Copy
 - b. ☐ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☒ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information: A copy of the original specification reprinted for legibility.

U.S. APPLICATION NO. (If known, see 37 CFR 1.50) 09/937067		INTERNATIONAL APPLICATION NO. PCT/GB00/00966		ATTORNEY'S DOCKET NUMBER 9021-11	
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<p>17. [X] The following fees are submitted:</p> <p>Basic National Fee (37 CFR 1.492(a)(1)-(5)): Search Report has been prepared by the EPO or JPO\$860.00</p> <p>International preliminary examination fee paid to USPTO (37 CFR 1.482).\$690.00</p> <p>No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2))\$710.00</p> <p>Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO.\$1,000.00</p> <p>International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4).\$100.00</p> <p>ENTER APPROPRIATE BASIC FEE AMOUNT = \$860.00</p> <p>Surcharge of \$130.00 for furnishing the oath or declaration later than [] 20 [] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:20%;">Claims</th> <th style="width:20%;">Number Filed</th> <th style="width:20%;">Number Extra</th> <th style="width:20%;">Rate</th> <th style="width:20%;"></th> <th style="width:20%;"></th> </tr> <tr> <td>Total Claims</td> <td>8-20 =</td> <td>13</td> <td>X \$18.00</td> <td>\$</td> <td></td> </tr> <tr> <td>Independent Claims</td> <td>2-3 =</td> <td>0</td> <td>X \$80.00</td> <td>\$</td> <td></td> </tr> <tr> <td colspan="3">Multiple dependent claim(s) (if applicable)</td> <td>+ \$270.00</td> <td>\$</td> <td></td> </tr> <tr> <td colspan="4">TOTAL OF ABOVE CALCULATIONS =</td> <td>\$</td> <td></td> </tr> <tr> <td colspan="4">Reduction by 1/2 for filing by small entity, if applicable. Applicant qualifies as Small Entity under 37 CFR 1.27.</td> <td>\$</td> <td></td> </tr> <tr> <td colspan="4">SUBTOTAL =</td> <td>\$ 860.00</td> <td></td> </tr> <tr> <td colspan="4">Processing fee of \$130.00 for furnishing the English translation later than [] 20 [] 30 months from the earliest claimed priority date (37 CFR 1.492(f)).</td> <td>\$</td> <td></td> </tr> <tr> <td colspan="4">TOTAL NATIONAL FEE =</td> <td>\$</td> <td></td> </tr> <tr> <td colspan="4">Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +</td> <td>\$</td> <td></td> </tr> <tr> <td colspan="4">TOTAL FEES ENCLOSED =</td> <td>\$860.00</td> <td></td> </tr> <tr> <td colspan="4"></td> <td style="text-align: right;">Amount to be refunded</td> <td>\$</td> </tr> <tr> <td colspan="4"></td> <td style="text-align: right;">charged</td> <td>\$</td> </tr> </table> <p>a. [X] A check in the amount of \$860.00 to cover the above fees is enclosed.</p> <p>b. [] Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.</p> <p>c. [X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 50-0220.</p> <p>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>SEND ALL CORRESPONDENCE TO:</p> <p>James R. Cannon SIGNATURE Myers Bigel Sibley & Sajovec Post Office Box 37428 Raleigh, North Carolina 27627</p> </div> <div style="width: 45%; border: 1px solid black; padding: 5px;"> <p>"Express Mail" mailing label number EL920740120US Date of Deposit: September 20, 2001</p> <p>I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to Box PCT, Commissioner for Patents, Washington, DC 20231.</p> <p style="text-align: center;"><i>Joyce Paoli</i></p> <p>Joyce Paoli Date of Signature: September 20, 2001</p> </div> <div style="width: 45%; text-align: center;"> <p>James R. Cannon</p> <p><u>35,839</u> REGISTRATION NUMBER</p> </div> </div>	Claims	Number Filed	Number Extra	Rate			Total Claims	8-20 =	13	X \$18.00	\$		Independent Claims	2-3 =	0	X \$80.00	\$		Multiple dependent claim(s) (if applicable)			+ \$270.00	\$		TOTAL OF ABOVE CALCULATIONS =				\$		Reduction by 1/2 for filing by small entity, if applicable. Applicant qualifies as Small Entity under 37 CFR 1.27.				\$		SUBTOTAL =				\$ 860.00		Processing fee of \$130.00 for furnishing the English translation later than [] 20 [] 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$		TOTAL NATIONAL FEE =				\$		Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$		TOTAL FEES ENCLOSED =				\$860.00						Amount to be refunded	\$					charged	\$
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Attorney's Docket No. 9021-11

PATENT

IN THE UNITED STATES DESIGNATED OFFICE (DO/US)

In re: Application of Eliot Crowe et al;
Serial No.: To be Assigned
Filed: Concurrently Herewith
For: *BATTERY CASING*

Date: September 20, 2001

BOX PCT
Commissioner for Patents
Washington, DC 20231

PRELIMINARY AMENDMENT

Sir:

Prior to the examination of the above application and calculation of claim fees, please amend the above-identified application as indicated below. Attached hereto at page 4 is a marked-up version of the changes made to the original specification and the claims a PCT submitted in Article 19 Amendment by the current amendment. The marked-up version of the changes is captioned "Version With Markings To Show Changes Made".

In the Specification:

On page 1, line 1, please insert the following:

Cross-Reference to Related Applications

The present application is a U.S. national phase application of PCT International Application No. PCT/GB00/00966, having an international filing date of March 21, 2000 and claiming priority to Great Britain Application Nos. 9906536.9 and 9928496.0 filed March 23, 1999 and December 3, 1999. The above PCT International Application was published in the English language and has International Publication No. WO 00/57501.

In the Claims:

Please cancel Claim 9.

Please amend the following claims from the form set forth in Applicant's Article 19 Amendment.

3. A battery casing according to Claim 1, wherein the top surface of the cover lies no higher than the adjacent surface of the battery.

4. A battery casing according to Claim 1 wherein the guide means comprises a nozzle protruding from the cover and to which a flexible tube may be attached.

7. A battery casing according to Claim 1, wherein the cover is removable from the lid.


8. A battery casing according to Claim 1 wherein the cover and the lid each has two straight parallel sides and two semi-circular ends, the guide means being located in the middle of one semi-circular end of the lid.

In re: Application of Eliot Crowe et al;
Serial No.: To be assigned
Filed: Concurrently herewith
Page 3 of 4

REMARKS

Claims 1, 2, 5 and 6 are presented for examination and correspond to the substitute claims submitted during PCT examination. Claims 3, 4, 7 and 8 have been amended to better conform to U.S. practice. Applicants respectfully request substantive examination on the merits.

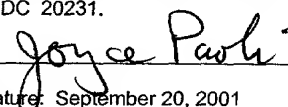
Respectfully submitted,


James R. Cannon
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"Express Mail" mailing label number EL920740120US
Date of Deposit: September 20, 2001

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to Attn: BOX PCT, Commissioner for Patents, Washington, DC 20231.


Joyce Paoli
Date of Signature: September 20, 2001

Version With Markings To Show Changes Made

In the Specification:

On page 1, line 1, please insert the following:

Cross-Reference to Related Applications

The present application is a U.S. national phase application of PCT International Application No. PCT/GB00/00966, having an international filing date of March 21, 2000 and claiming priority to Great Britain Application Nos. 9906536.9 and 9928496.0 filed March 23, 1999 and December 3, 1999. The above PCT International Application was published in the English language and has International Publication No. WO 00/57501.

In the Claims:

3. (Amended) A battery casing according to [either one of the preceding claims] Claim 1, wherein the top surface of the cover lies no higher than the adjacent surface of the battery.

4. (Amended) A battery casing according to [any one of the preceding claims] Claim 1 wherein the guide means comprises a nozzle [(43)] protruding from the cover and to which a flexible tube may be attached.

7. (Amended) Battery casing according to [any one of the preceding claims] Claim 4, wherein the cover is removable from the lid.

8. (Amended) A battery casing according to [any one of the preceding claims] Claim 4 wherein the cover and the lid each has two straight parallel sides and two semi-circular ends, the guide means [(43)] being located in the middle of one semi-circular end of the lid.

BATTERY CASING

This invention relates to a battery casing, and in particular to a valve regulated lead acid battery casing.

During the operation of a lead acid battery, gases including hydrogen are expelled from the cell or cells. There is thus the danger of an explosive mixture of expelled hydrogen and oxygen in the air being formed near the battery. Further, the expelled gases may carry acid vapour or even droplets and there is the possibility of corrosion of metals outside the battery occurring.

It is an object of the present invention to provide a battery casing which prevents or reduces the effects of the above disadvantages.

In accordance with the invention a battery casing comprises a lid having a top surface and a recess inset into the said top surface, a vent at the base of the recess through which gas is expelled from the battery, a cover for sealingly covering the recess, a gas collection space being defined within the covered recess, and a guide means for guiding gas from the collection space away from the battery, wherein the cover may be positioned in more than one orientation.

Preferably a plurality of vents, e g one for each cell, is provided at the base of the recess.

Preferably the top surface of the cover lies no higher than the adjacent surface of the battery.

The guide means may comprise a nozzle protruding from the cover and to which a flexible tube may be attached.

One embodiment of the invention will now be described by way of example only, with reference to the accompanying drawings of which:

Figure 1 is a perspective view of a battery having a casing according to the invention;

Figure 2 is a plan view of the battery shown in Figure 1 on an enlarged scale;

Figure 3 is a cross-section on line III-III of Figure 2;

Figure 4 is a cross-section on line IV-IV of Figure 2;

Figure 5 is a cross-section on line V-V of Figure 2;

Figure 6 is a plan view of the battery shown in Figure 1 with the cover removed;

Figure 7 is a cross-section on line VII-VII of Figure 2; and

Figure 8 is an enlarged view of detail VIII of Figure 7.

The battery illustrated has a shape and dimensions particularly allowing its use in standard telecommunications racking, for example, in accordance with ETSI Standards.

As shown the battery having a casing 1 according to the invention comprises a rectangular box 2 having a lid 3 and two handles 4, 5 one at each end. The casing is made of moulded plastic material e.g. ABS. As viewed from the top (see Figure 1) the battery has two long sides and two short sides. A positive terminal 6 and a negative terminal 7 are positioned on the top surface and close to one of the short sides. As shown particularly in Figure 1, the terminals 6 and 7 are protected by box-like shields 9 and 10 respectively. The battery illustrated has six cells, so the casing is divided by internal walls 11, see Figures 3 and 4 particularly.

Inset into the upper surface of the lid 3, is an elongated recess 12 having two straight parallel sides 13, 14 and semi-circular end parts 15, 16. The recess is formed in the lid by a suitable moulding operation and the two straight parallel sides of the recess lie parallel to the two long sides of the battery. At the base of the recess are six vents 17, one for each cell, and two flame arrester supports 26, 27. The supports are located one adjacent each end part of the recess and each comprises an upstanding circular flange 28 with four regularly spaced-apart openings 29 (see Figures 6 and 8).

The periphery of the recess is defined by a vertical wall 18. Inwardly of the wall is an upstanding flange 19 having a height less than that of the wall over most of the wall length. The straight parts of the flange 19 are provided on its inner side with a plurality of triangular buttresses 55 to provide rigidity. A groove 21 is defined between the flange and the wall and a shoulder 20 is formed within the groove 21 adjacent the flange 19. Thus the groove 21 has a deep portion adjacent the wall 18 and a shallow portion adjacent the flange 19.

At the centre of both semi-circular end parts 15, 16 of the recess 2, the

wall 18 is interrupted by a semi-circular depression 22 (see Figure 8). Both depressions, one at each end of the recess as viewed in plan (see Figure 6) lead into semi-circular cross-sectional channels 23, 24 moulded into the lid. Each channel extends along the mid-line of the battery towards the two narrow ends of the lid respectively. One channel, 24, leads between the two terminals 6 and 7 and their associated shields 9 and 10.

A cover 25 of similar material to the casing 1, is moulded to fit tightly into the recess 12 in the lid 3. The level of the upper surfaces of the lid 3 and of the cover 25 lies below the level of the tops of the shields 9 and 10 when the cover is positioned in the recess. Thus, like the recess 12, the cover 25 has two straight sides 30, 31 and two semi-circular ends 32, 33. Around the periphery of the cover 25 is a cover flange 34, the outer surface 35 of which engages the wall 18 of the recess. The cover flange 34 is the same depth as the wall 18 so that the lower extremity 36 of the cover flange 34 fits into the deep part 18 of the groove 20 and the upper surface 37 of the cover 25 is level with the upper surface 38 of the lid 3. The level of the upper surfaces of the lid 3 and of the cover 12 lies below the tops of the shields 9 and 10 when the cover is positioned in the recess. The cover flange 34 has a shoulder 39 on its inner side and over most of its length. This shoulder 39 has an inner surface 40 which lies alongside the outer surface 41 of the flange 19 in the recess 25 on the lid 3. As can be seen particularly in Figures 3 and 4, a rectangular cross-sectional channel 42 is defined between the inner surface of the cover flange, above the shoulder 20 in the groove 21 in the recess 12, outwardly of the flange in the recess and below the shoulder on the lid. An 'O' ring seal (not shown in the drawings) is located within the channel 42 to provide an air-tight seal between the cover 25 and the recess 12. Optionally, the cover 25 may be removed from the recess and subsequently replaced.

At the centre of one semi-circular end part 32 (the left-hand end as shown in Figure 2) the cover 25 is formed with a horizontally-extending nozzle 43 for receiving the end of a flexible tube (not shown). An external enlargement 44 is provided adjacent the nozzle mouth 45 to provide a means to prevent the tube becoming detached. The nozzle mouth 45 lies in the channel 24 between the

terminals 6 and 7 and their associated shields 9 and 10 so that the tube passes between the terminals and associated shields. As can be seen in Figure 8 the nozzle has an internal tapered passage 46, the end of which terminates in a cylindrical recess 47 having a shoulder 48 adjacent the upper part thereof. A flame arrester 49 comprising a porous polyethylene or ceramic disc 49 seats within the recess 47 on the shoulder 48 so that a small gap 50 is provided between the arrester 49 and the upper part of the recess 51. The flame arrester 49 is a push fit in the recess 47 and is also held in position on the upper edges 52 of the four parts of the circular flange 28 of the arrester support.

In use, gas escapes from the cells of the battery through the valves and collects in the recess under the cover. As pressure increases the gas passes through the flame arrester, through the small gap, along the nozzle passage and then through the tube to a safe location away from the battery. If the battery is positioned on racking with the terminals near the front thereof, the tube will also project from the front.

In the embodiment illustrated the cover may be positioned in the lid recess the opposite way round i e with the nozzle at the right-hand side as shown in Figure 2, thus giving the user a choice of operation. The tube attached to the nozzle in this position will thus pass across the short side of the battery further from that where the terminals are located. Thus if the terminals are located at the front of standard racking, the gases escaping from the cells through the flame arrester are led away to the rear of the racking. This may be advantageous.

CLAIMS:

- 1 A battery casing (1) comprising a lid (3) having a top surface and a recess (12) inset into the said top surface, a vent (17) at the base of the recess through which gas is expelled from the battery, a cover (25) for sealingly covering said recess, sealing means to provide a seal between the cover and the recess, a gas collection space being defined within the covered recess, and a gas guide means (43) formed integrally with and in one position within the cover for guiding gas from the collection space away from the battery, wherein the cover and therefore the gas guide means may be positioned in more than one orientation to the battery casing.
- 2 A battery casing according to Claim 1, comprising a plurality of vents (17) at the base of the recess, one for each of the battery cells.
- 3 A battery casing according to either one of the preceding claims, wherein the top surface of the cover lies no higher than the adjacent surface of the battery.
- 4 A battery casing according to any one of the preceding claims wherein the guide means comprises a nozzle (43) protruding from the cover and to which a flexible tube may be attached.
- 5 A battery casing according to Claim 4, wherein the lid has a channel (23, 24) extending from the recess in which the guide means is located.
- 6 A battery casing according to Claim 5, wherein the lid has a plurality of channels extending from the recess in at least one of which the guide means is located.
- 7 A battery casing according to any one of the preceding claims, wherein the cover is removable from the lid.
- 8 A battery casing according to any one of the preceding claims wherein the cover and the lid each has two straight parallel sides and two semi-circular ends, the guide means (43) being located in the middle of one semi-circular end of the lid.
- 9 A battery casing substantially as described herein with reference to and as illustrated in the accompanying drawings.

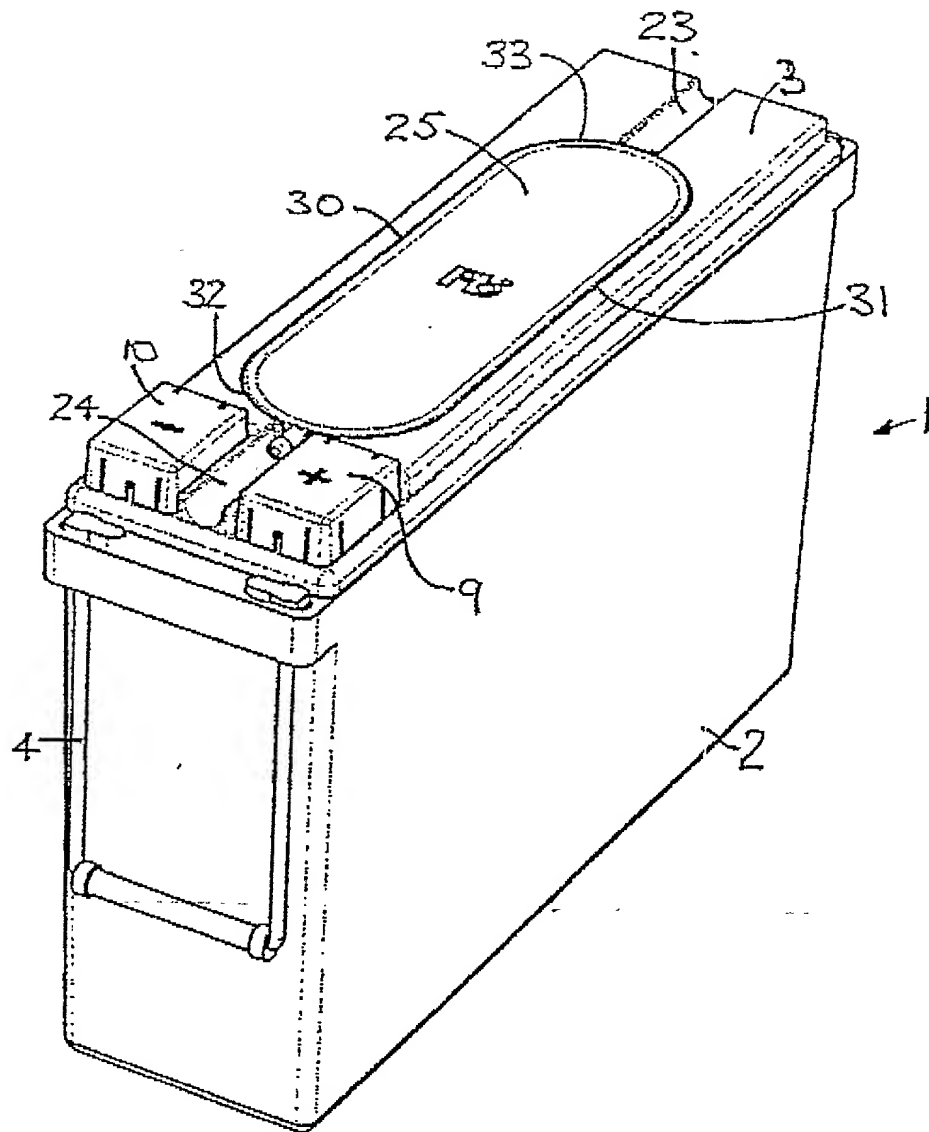


Figure 1

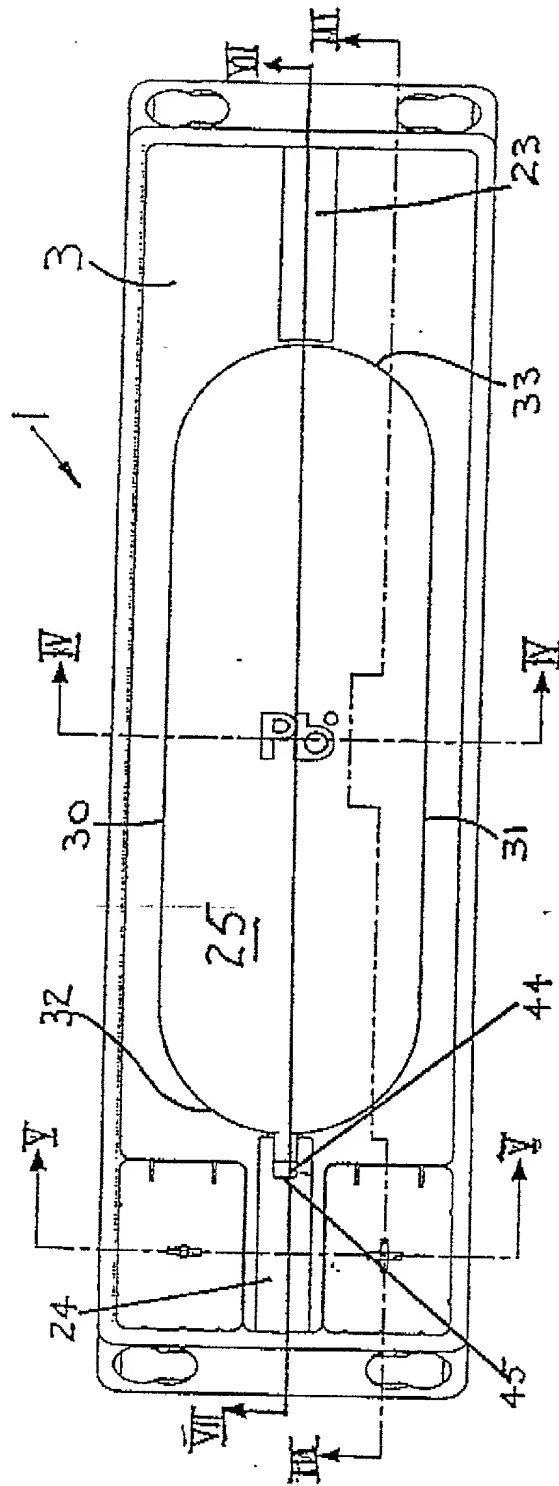
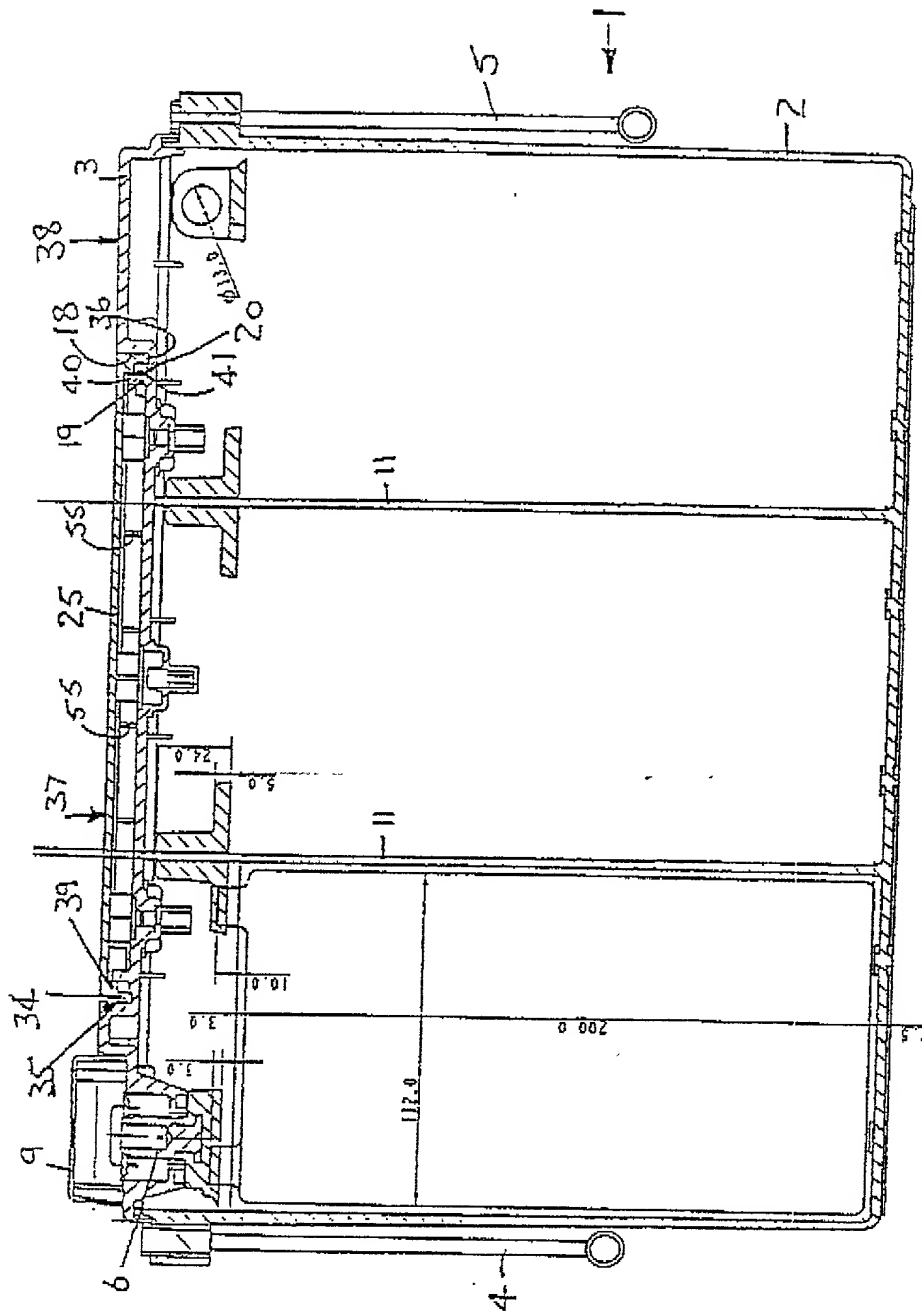


Figure 2



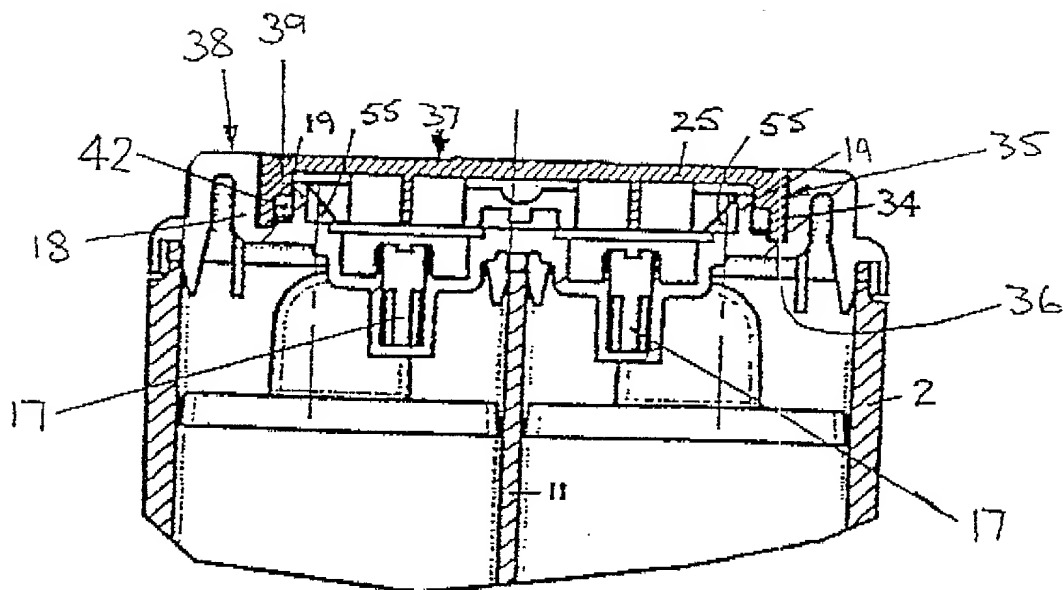


Figure 4

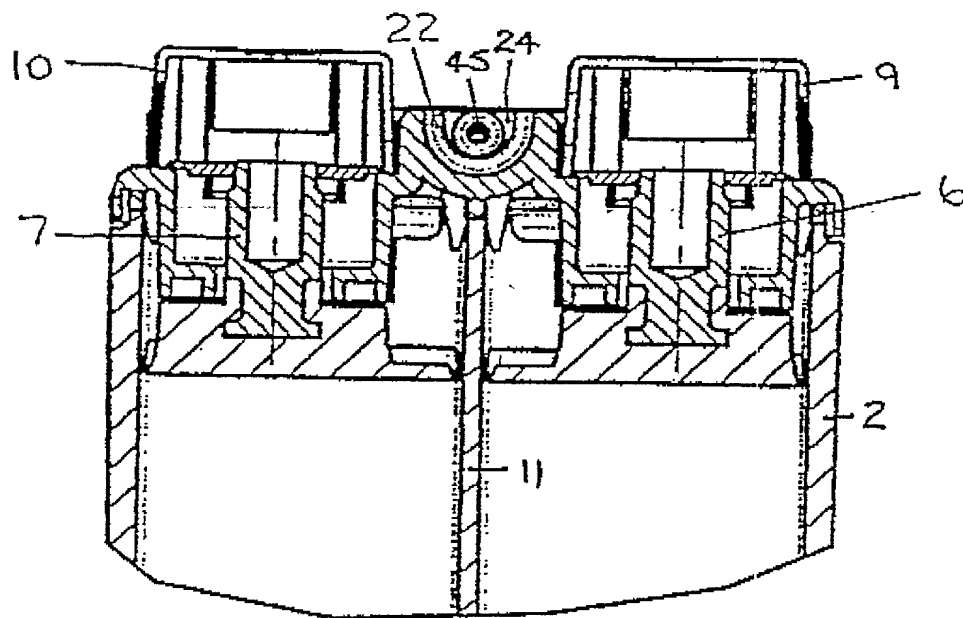


Figure 5

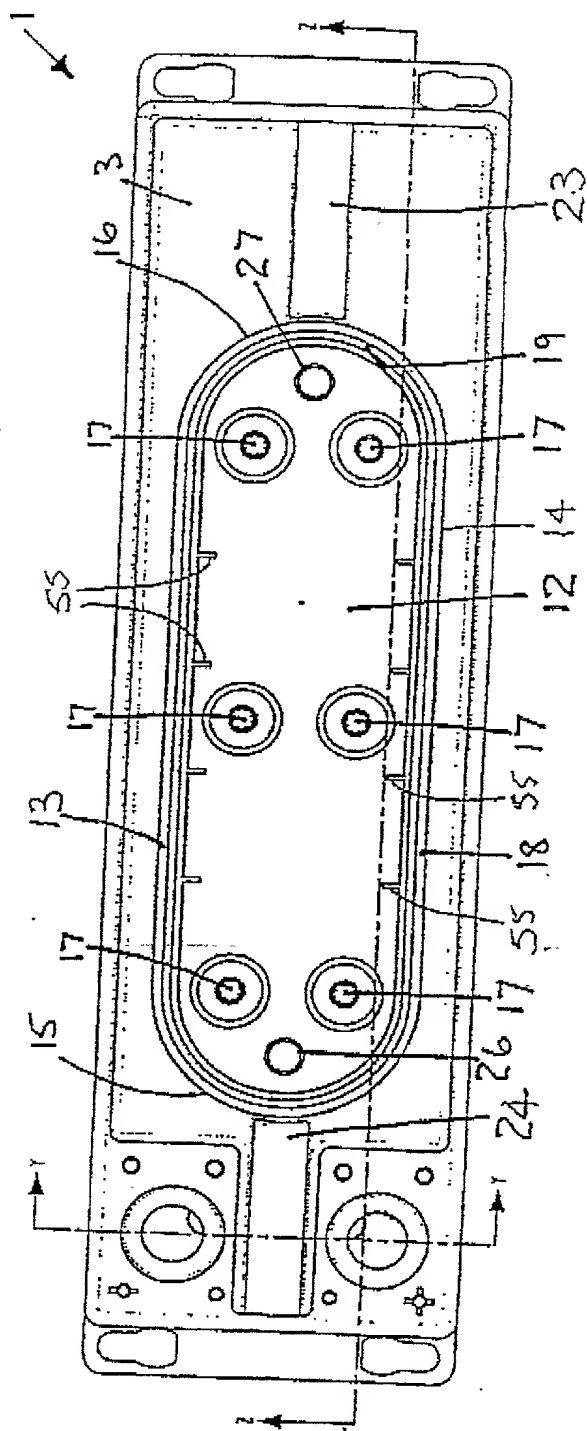


Figure 6

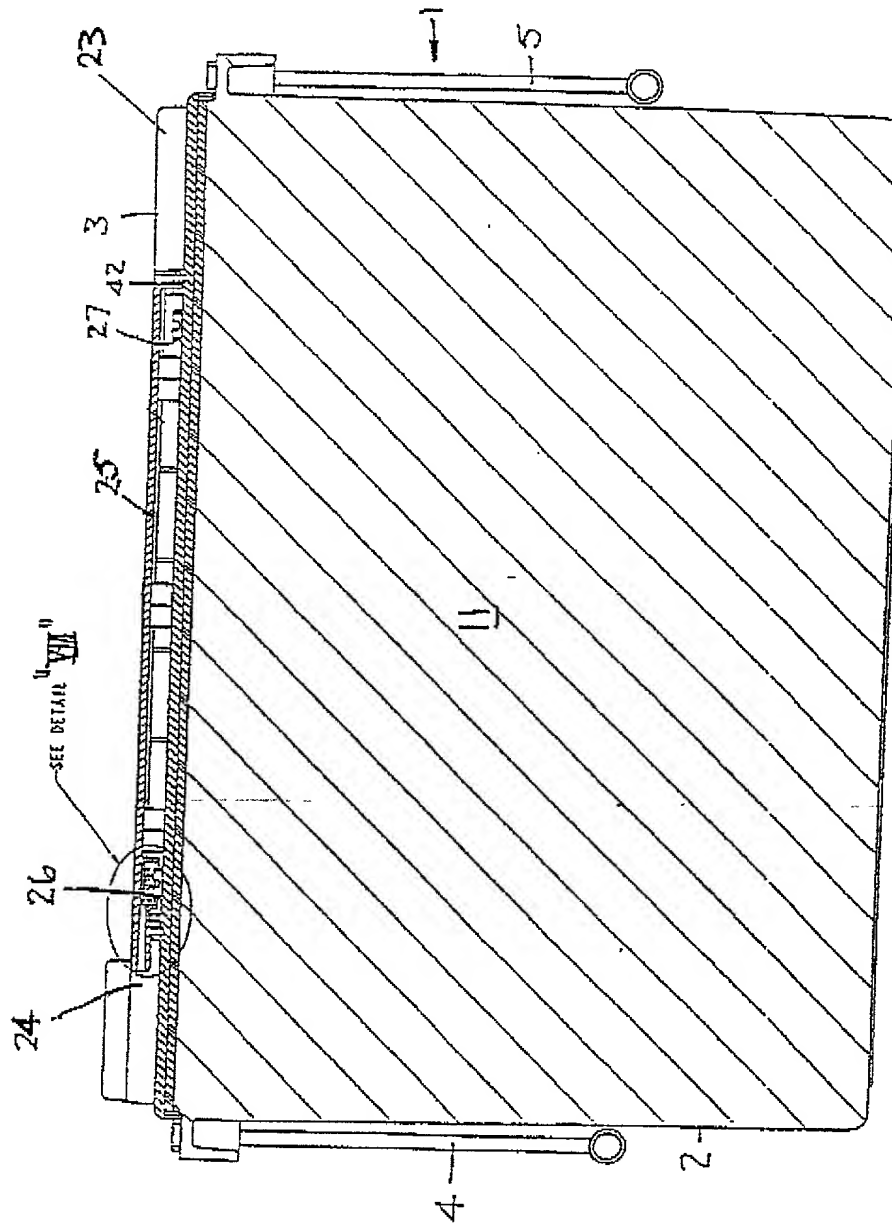


Figure 7

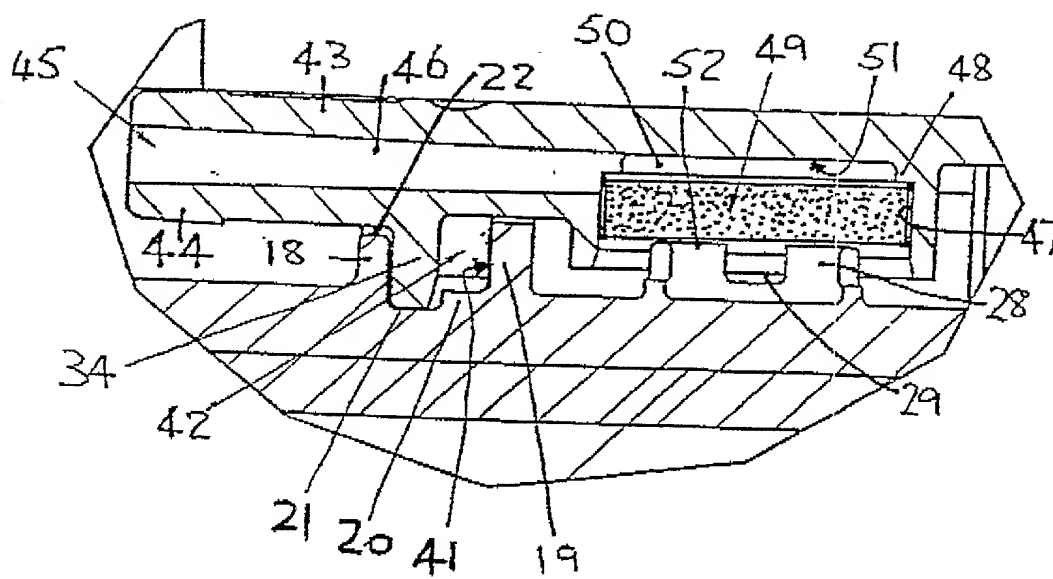


Figure 8



DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

Attorney Docket No. 9021-11

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled BATTERY CASING,

the specification of which

☐ is attached hereto

OR

☒ was filed on September 20, 2001 as United States Application No. 09/937,067 or PCT

International Application Number _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37 Code of Federal Regulations, §1.56, including material information that became available between the filing date of the prior application and the National or PCT International filing date of the continuation-in-part application, if applicable.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate, or of any PCT International application having a filing date before that of the application on which priority is claimed.

PCT/GB00/00966	PCT	3/23/00	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Number	Country	MM/DD/YYYY Filed	Priority Claimed
9906536.9	Great Britain	3/23/99	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Number	Country	MM/DD/YYYY Filed	Priority Claimed
9928496.0	Great Britain	12/3/99	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Number	Country	MM/DD/YYYY Filed	Priority Claimed

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

Application Number(s)	Filing Date (MM/DD/YYYY)
Application Number(s)	Filing Date (MM/DD/YYYY)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) or § 365(c) of any PCT international application designating the United States of America, listed below.

Appln. Serial No.	Filing Date	Status Patented/Pending/Abandoned
Appln. Serial No.	Filing Date	Status Patented/Pending/Abandoned
Appln. Serial No.	Filing Date	Status Patented/Pending/Abandoned

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following registered attorney(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. I also appoint the following registered attorney(s) to represent me before all competent International Authorities in connection with any and all international applications filed by me with an appropriate receiving office claiming priority to the U.S. application. I also appoint the following registered attorney(s) to make or receive payment on my behalf in connection with the filing of such international applications.

Customer Number:



20792

PATENT TRADEMARK OFFICE

Send correspondence to:

James R. Cannon
Customer Number:



20792

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